

Claims

What is claimed is:

- 5
1. An elongated structural reinforcing strip comprising:
 - a. elongated continuous parallel fibers having lengths extending along the length of the strip;
 - b. nondirectional fibers distributed transversely across the strip; and
 - c. a polymer matrix affixing the parallel and nondirectional fibers.
- 10
- wherein the strip is affixed to the surface of a structure by several fasteners inserted through the strip and into the structure.
2. The strip of claim 1 wherein at least some of the parallel fibers are transversely arrayed across the strip with discrete spaces therebetween, and wherein the discrete spaces are at least sufficiently large to accommodate one of the fasteners therein.
 3. The strip of claim 1 wherein the nondirectional fibers are distributed at least substantially uniformly across the strip.
 4. The strip of claim 1 wherein the nondirectional fibers define a nonwoven mat.
 5. The strip of claim 1 wherein the nondirectional fibers are continuous fibers.
 6. The strip of claim 1 wherein the strip is sufficiently flexible that it may be coiled into a roll.
 7. The strip of claim 1 wherein the parallel fibers are provided in bundles discretely spaced transversely across the strip.

5

HEB
AI

10

11
12
13
14
15
16
17
18
19
20

15

20

- 8. The strip of claim 7 wherein the bundles are at least substantially evenly spaced transversely across the strip.
- 9. The strip of claim 7 wherein the nondirectional fibers define a nonwoven mat.
- 10. The strip of claim 9 wherein the nondirectional fibers are distributed at least substantially uniformly across the strip.
- 11. The strip of claim 1 wherein:
 - a. the polymer matrix is chosen from at least one of phenolic resin, vinylester resin, polyester resin, and epoxy; and
 - b. the fibers are chosen from at least one of carbon fibers, glass fibers, and aramid fibers.
- 12. The strip of claim 1 wherein:
 - a. the parallel fibers include carbon fibers; and
 - b. the nondirectional fibers include glass fibers.
- 13. The strip of claim 1 wherein the strip includes at least 50% fiber by volume.

503
A1

5

10

15

20

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

14. A method of reinforcing a structure comprising the steps of:
 - a. providing an elongated structural reinforcing strip which includes:
 - i. elongated continuous parallel fibers having lengths extending along the length of the strip;
 - ii. nondirectional fibers distributed transversely across the strip; and
 - iii. a polymer matrix affixing the parallel and nondirectional fibers;
 - b. placing the strip upon a surface of the structure;
 - c. inserting several fasteners through the strip and into the structure.
15. The method of claim 14 wherein the step of inserting the fasteners includes detonating a fastener-driving charge.
16. The method of claim 14 further comprising the step of forming at least one aperture in the structure prior to placing the strip thereon, wherein one of the several fasteners is inserted within the aperture.
17. The method of claim 14 further comprising the step of providing a compressible cushion between at least one of the several fasteners and the strip prior to inserting the fastener through the strip.
18. The method of claim 14 further comprising the step of applying adhesive between the strip and the surface of the structure.

5

543
N1

10

FOR INFORMATION

19. A reinforced structure comprising:
- a. an elongated strip having a polymer matrix with embedded fibers, the fibers including:
 - i. elongated continuous fibers having parallel lengths extending along the length of the strip, and
 - ii. nondirectional fibers; and
 - b. a series of fasteners extending through the strip and into the surface of the structure.
20. The reinforced structure of claim 19 wherein at least some of the nondirectional fibers have lengths greater than or equal to a distance defined between adjacent parallel continuous fibers.